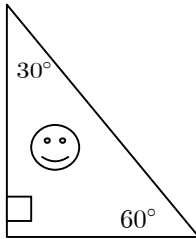


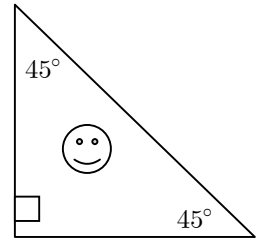
Special Triangles

Name: _____

30—60—90



45—45—90



Materials Needed

$\frac{1}{2}$ Sheet of colored paper

ruler

$\frac{1}{2}$ Sheet of a different color of paper

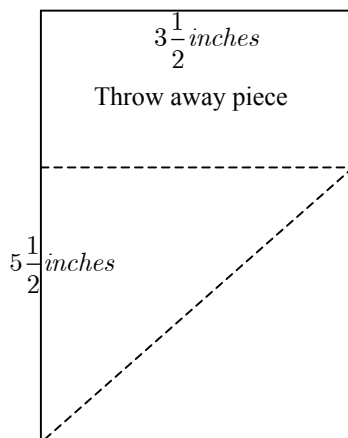
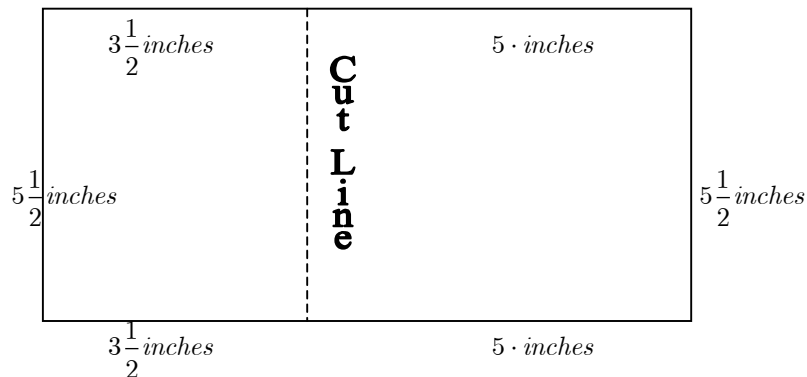
protractor

scissors

glue

The Creation of Special Triangles

Take one of the sheets and measure as indicated then cut on the dotted line.



Fold to form a square, the “regular quadrilateral”

Fold line vocabulary word chain

Fold Line →

Diagonal of a square →

Angle bisector of a square →

Hypotenuse of a right triangle.

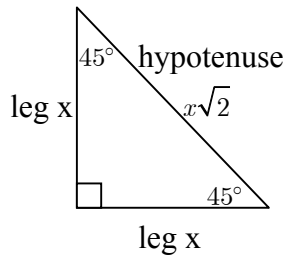
Sides of the square →

Congruent Legs of a right triangle

Special Triangles

Name: _____

Label the 45—45—90



Use the Pythagorean Theorem
“Power Tool”

$$a^2 + b^2 = c^2$$

$$(leg)^2 + (leg)^2 = (hyp)^2$$

$$x^2 + x^2 = c^2$$

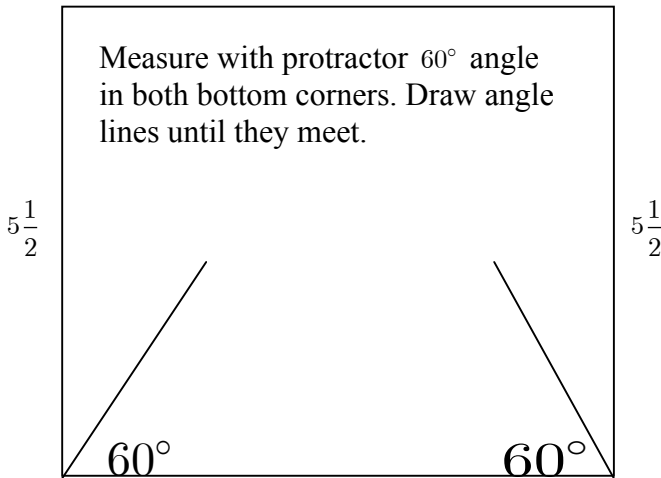
$$2x^2 = c^2$$

$$\sqrt{2x^2} = \sqrt{c^2}$$

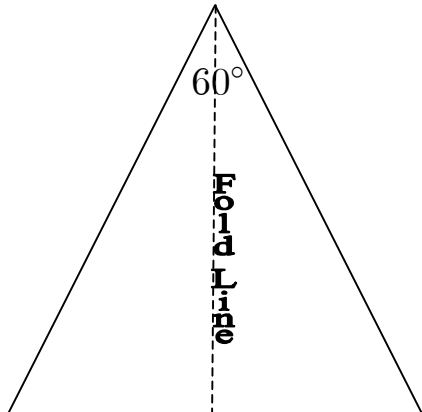
$$x\sqrt{2} = c$$

| Leg | Leg | Hypotenuse |
|-----|-----|-------------|
| x | x | $x\sqrt{2}$ |
| 4 | | |
| | | $5\sqrt{2}$ |
| | 6 | |
| | | 10 |

5



5



Create an equilateral triangle or the
“regular triangle”

Word chain for the fold line.

Fold line →

Angle bisector →

Altitude →

Median →

Special Triangles

Name: _____

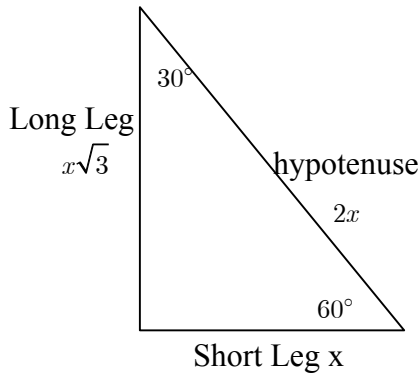
Opposite 30°
Short Leg

Opposite 60°
Long Leg

Opposite 90°
Hypotenuse



Label the 30-60-90



Use the Pythagorean Theorem.

“Power Tool”

$$a^2 + b^2 = c^2$$

$$(short \cdot leg)^2 + (long \cdot leg)^2 = (hypotenuse)^2$$

$$(x)^2 + (long \cdot leg)^2 = (2x)^2$$

$$(long \cdot leg)^2 = (2x)^2 - x^2$$

$$(long \cdot leg)^2 = 4x^2 - x^2$$

$$(long \cdot leg)^2 = 3x^2$$

$$\sqrt{(long \cdot leg)^2} = \sqrt{3x^2}$$

$$(long \cdot leg) = x\sqrt{3}$$

| Short Leg | Long Leg | Hypotenuse |
|-----------|-------------|------------|
| x | $x\sqrt{3}$ | $2x$ |
| 4 | | |
| | $5\sqrt{3}$ | |
| | | 10 |
| | 6 | |

Now For The Mostly Ridiculous, Profoundly Stupid & Absolutely Absurd.

The next $\frac{1}{2}$ sheet of paper:

Step 1-Fold Hamburger.

Step 2-Fold a top edge down about $\frac{1}{2}$ inch.

Step 3-Glue the edges-so as to make a pocket.

Step 4-This is a “Special Pocket” for the “Special Triangles.” This is also a place to write extra notes & examples.

Step 5-Recommend that you make this at the beginning while you have your geometry tools out. (i.e. scissors, glue, rulers and protractors etc.)

Note: You may use the special triangle pocket on tests. So take good notes!

Special Triangles

Name: _____

A "Special Triangle" Adventure

| | | | |
|--|------------|------------|------------|
| | 45° | 45° | 90° |
|--|------------|------------|------------|

| | | | |
|--|------------|------------|-------------------|
| | Leg | Leg | Hypotenuse |
|--|------------|------------|-------------------|

| | | | |
|----|-----|-------------|---------------|
| 1. | x | x | $x\sqrt{2}$ |
| 2. | | 15 | |
| 3. | 3.2 | | |
| 4. | | | $6.4\sqrt{2}$ |
| 5. | | $5\sqrt{2}$ | |

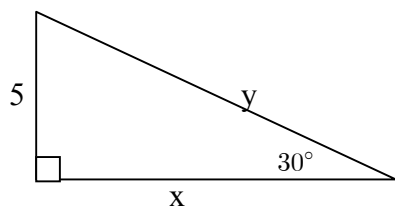
| | | | |
|--|---------------------------------------|---------------------------------------|---------------------------------------|
| | Opposite 30° | Opposite 60° | Opposite 90° |
|--|---------------------------------------|---------------------------------------|---------------------------------------|

| | | | |
|--|------------------|-----------------|-------------------|
| | Short Leg | Long Leg | Hypotenuse |
|--|------------------|-----------------|-------------------|

| | | | |
|-----|-----|-------------|-------------|
| 6. | x | $x\sqrt{3}$ | $2x$ |
| 7. | | | 15 |
| 8. | 20 | | |
| 9. | | $9\sqrt{3}$ | |
| 10. | | | $8\sqrt{3}$ |
| 11. | | 12 | |
| 12. | 3.2 | | |

Solve the Triangle:

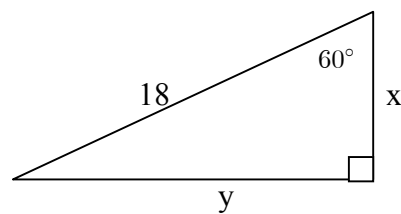
13.



x: _____

y: _____

14.

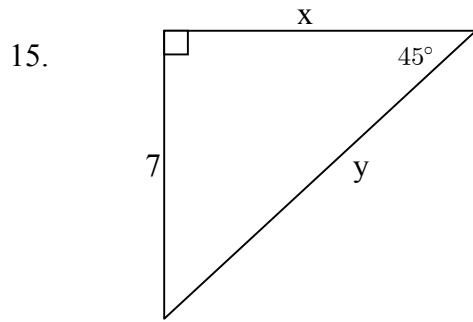


x: _____

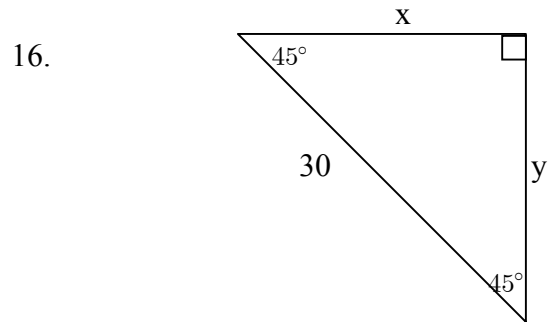
y: _____

Special Triangles

Name: _____



x: _____ y: _____



x: _____ y: _____

Word Problems

17. In $\triangle EFG$, $\angle E$ is a right angle and $m\angle F = 45^\circ$. If $EF = 28\text{ feet}$, find $EG =$ _____

18. In $\triangle ABC$, $\angle A$ is a right angle and $m\angle B = 45^\circ$. If $BC = 13\text{ feet}$, find $AB =$ _____

19. In $\triangle ABC$, $\angle A$ is a right angle and $m\angle B = 60^\circ$. If $AB = 24\text{ feet}$, find $AC =$ _____

20. $\triangle ABC$, $\angle A$ is a right angle and $m\angle B = 30^\circ$. If $AC = 46\text{ feet}$, find $AB =$ _____

21. In $\triangle EFG$, $\angle E$ is a right angle and $m\angle F = 45^\circ$. If $EF = 20\text{ feet}$, find $FG =$ _____

22. In $\triangle EFG$, $\angle E$ is a right angle and $m\angle F = 45^\circ$. If $EF = 37\text{ feet}$, find $EG =$ _____

23. In $\triangle ABC$, $\angle A$ is a right angle and $m\angle B = 60^\circ$. If $AB = 14\text{ feet}$, find $BC =$ _____

24. In $\triangle ABC$, $\angle A$ is a right angle and $m\angle B = 30^\circ$. If $AB = 22\text{ feet}$, find $BC =$ _____